

WHAT IS CLAIMED IS:

1. An image formation system comprising:

aplurality of image formation apparatuses connected together,  
each image of the formation apparatuses having an image input  
5 section for inputting a draft image and an image output section  
for outputting the draft image, a predetermined one of the  
plurality of the image formation apparatuses reading the draft  
image at the image input section of the predetermined image  
formation apparatus, and the plurality of the image formation  
10 apparatuses producing outputs of the draft image at their image  
output sections;

a preparing unit which prepares calibration data  
containing calibration patterns being collected at the image  
15 input section of the predetermined image formation apparatus  
to be output from the image output section of each of the image  
formation apparatus; and

a correcting unit which corrects the draft image input  
from the image input section of the predetermined image  
20 formation apparatus based on the calibration data prepared  
by the preparing unit.

2. The image formation system according to claim 1, wherein  
the correcting unit further comprises:

25 a parameter calculating unit which calculates image

processing parameters relating to read characteristics of the image input section of the predetermined image formation apparatus and print characteristics of the image output sections of the plurality of the image formation apparatuses, based on the calibration data prepared by the preparing unit; and

a converting unit which converts the draft image input from the image input section of the predetermined image formation apparatus, using the image processing parameters calculated by the parameter calculating unit.

3. The image formation system according to claim 2, wherein the parameter calculating unit calculates image processing parameters to be used for a gradation conversion by comparing the calibration data with predetermined target data.

4. The image formation system according to claim 2, further comprising a parameter memory for storing image processing parameters calculated by the parameter calculating unit, wherein the converting unit converts the draft image input from the image input section of the predetermined image formation apparatus using the image processing parameters stored in the parameter memory only when the draft image input by the image input section of the predetermined image formation

apparatus is to be output from the image output section of another one on the image formation apparatus among the plurality of the image formation apparatuses.

5 5. The image formation system according to claim 1, wherein the preparing unit resides in the predetermined image formation apparatus , and each of the plurality of the image formation apparatuses comprises the correcting unit.

10 6. The image formation system according to claim 1, wherein the image input section is a color scanner, and the image output section is a color printer.

7. An image formation system comprising:  
15 a plurality of image formation apparatuses connected together, each of the image formation apparatuses having an image input section for inputting a draft image and an image output section for outputting the draft image, each of the image formation apparatuses reading a draft image at its image input section,  
20 and a predetermined one of the plurality of image formation apparatus producing an output of the draft images from the image output section of the predetermined image formation apparatus;

25 a preparing unit which prepares calibration data

containing calibration patterns being collected at the image input section of each of the image formation apparatuses to be output from the image output section of the predetermined image formation apparatus; and

5           a correcting unit which corrects the draft images input from the image input sections of the plurality of image formation apparatuses based on the calibration data prepared by the preparing unit.

10       8.     The image formation system according to claim 7, wherein the correcting unit comprises:

          a parameter calculating unit which calculates image processing parameters relating to read characteristics of the image input sections of the plurality of image formation  
15   apparatuses and print characteristics of the image output section of the predetermined image formation apparatus, based on the calibration data prepared by the preparing unit; and

          a converting unit which converts the draft images input from the image input sections of the plurality of the image  
20   formation apparatuses, using the image processing parameters calculated by the parameter calculating unit.

9.     The image formation system according to claim 8, wherein the parameter calculating unit calculates image  
25   processing parameters to be used for a gradation conversion,

by comparing the calibration data with predetermined target data.

10. The image formation system according to claim 8, further  
5 comprising:

a parameter memory which stores the image processing parameters calculated by the parameter calculating unit, wherein

the converting unit converts the draft image input from  
10 the image input section of each of the image formation apparatuses using the image processing parameters stored in the parameter memory, only when the draft image input by the image input section of each of the image formation apparatuses is to be output from the image output section of the predetermined  
15 image formation apparatus.

11. The image formation system according to claim 7, wherein  
each of the plurality of the image formation apparatuses comprises the preparing unit, and the correcting unit resides  
20 in the predetermined image formation apparatus .

12. The image formation system according to claim 7, wherein  
the image input section is a color scanner, and the image output section is a color printer.

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13. An image formation method using a plurality of image formation apparatuses connected together, each image formation apparatus having an image input section for inputting a draft image and an image output section for outputting the draft  
5 image, comprising the steps of:

(a) reading a draft image at the image input section of a predetermined one of among the plurality of the image formation apparatuses;

(b) producing outputs of the draft image at the image  
10 output sections of the plurality of the image formation apparatuses;

(c) preparing calibration data containing calibration patterns being collected at the image input section of the predetermined image formation apparatus to be output to the  
15 image output section of each of the image formation apparatuses; and

(d) correcting the draft image input from the image input section of the predetermined image formation apparatus based on the calibration data prepared at the step (c).

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14. The image formation method according to claim 13, wherein step (b) further comprises the steps of:

(e) calculating image processing parameters relating to read characteristics of the image input section of the  
25 predetermined image formation apparatus and print

characteristics of the image output sections of the plurality of the image formation apparatuses based on the calibration data prepared at the preparing step; and

- (f) converting the draft image input from the image input  
5 section of the predetermined image formation apparatus using the image processing parameters calculated at the parameter calculating step.

15. The image formation method according to claim 14, wherein  
the image processing parameters are used for a gradation  
conversion, and wherein the image processing parameters are  
calculated by comparing the calibration data with predetermined  
5 target data.

16. The image formation method according to claim 14, further  
comprising the steps of:

(g) storing the image processing parameters in a parameter  
10 memory after step (e),  
wherein step (f) is carried out after step (g) only when the  
draft image input from the image input section of the  
predetermined image formation apparatus is to be output from  
the image output section of the image formation apparatuses.

15 17. The image formation method according to claim 13, wherein  
step (c) is carried out in the predetermined image  
formation apparatus and wherein step (d) is carried out in  
each of the plurality of the image formation apparatuses 18.

20 The image formation method according to claim 13, wherein  
the image input section is a color scanner, and the image  
output section is a color printer.

19. An image formation method using a plurality of image  
25 formation apparatuses connected together, each of the image



formation apparatuses having an image input section for inputting a draft image and an image output section for outputting the draft image, comprising the steps of:

(a) reading a draft image at the image input section of each  
5 of the plurality of image formation apparatuses;

(b) producing outputs of the draft images at the image output section of a predetermined one of the plurality of the image formation apparatuses;

(c) preparing calibration data containing calibration  
10 patterns collected at the image input section of each of the image formation apparatuses to be output from the image output section of the predetermined image formation apparatus; and

(d) correcting the draft images input from the image input sections of the plurality of the image formation  
15 apparatuses based on the calibration data prepared at the preparing step (c).

20. The image formation method according to claim 19, wherein step (d) further comprises:

(e) calculating image processing parameters relating  
20 to read characteristics of the image input sections of the plurality of the image formation apparatuses and print characteristics of the image output section of the predetermined image formation apparatus based on the  
25 calibration data prepared at the preparing step; and

(f) converting the draft images input from the image input sections of the plurality of the image formation apparatuses, using the image processing parameters calculated at the step (e).

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21. The image formation method according to claim 20, wherein the image processing parameters are used for a gradation conversion, and wherein the image processing parameters are calculated by comparing the calibration data with predetermined target data.

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22. The image formation method according to claim 20, further comprising:

(g) storing the image processing parameters in a parameter memory, wherein step (f) is carried out after step (g), and wherein step (f) is carried out

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only when the draft image input by the image input section of each the image formation apparatus is to be output from the image output section of the predetermined image formation apparatus.

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23. The image formation method according to claim 19, wherein step (c) is carried out in each of the plurality of the image formation apparatuses, and wherein step (d) is carried out in the predetermined image formation apparatus.

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24. The image formation method according to claim 19, wherein the image input section is a color scanner, and the image output section is a color printer.

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25. A computer-readable recording medium that stores a computer program encoding an image formation method, which employs a plurality of image formation apparatuses connected together, each of the image formation apparatuses having an  
10 image input section for inputting a draft image and an image output section for outputting the draft image, wherein the computer-readable recording medium storing the image formation method comprising the steps of:

(a) reading a draft image at the image input section of a  
15 predetermined one of the plurality of image formation apparatuses;

(b) producing outputs of the draft image from the image output sections of the plurality of the image formation apparatuses;

(c) preparing calibration data containing calibration  
20 patterns being collected at the image input section of the predetermined image formation apparatus to be output from the image output section of each image formation apparatus; and

(d) correcting the draft image input from the image input section of the predetermined image formation apparatus based  
25 on the calibration data prepared at the preparing step (c).

26. A computer program encoding an image formation method,  
which employs a plurality of image formation apparatuses  
connected together, each of the image formation apparatuses  
5 having an image input section for inputting a draft image and  
an image output section for outputting the draft image, wherein  
the image formation method comprises the steps of (a) reading  
a draft image at the image input section in a predetermined  
one of the plurality of the image formation apparatuses;

10 (b) producing outputs of the draft image from the image output  
sections of the plurality of the image formation apparatuses;

(c) preparing calibration data containing calibration  
patterns being collected at the image input section of the  
predetermined image formation apparatus to be output from the  
15 image output section of each of the image formation apparatuses;  
and

(d) correcting the draft image input from the image input  
section of the predetermined image formation apparatus based  
on the calibration data prepared at the step (c).

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27. A computer-readable recording medium that stores a  
computer program encoding an image formation method, which  
employs a plurality of image formation apparatuses connected  
together, each of the image formation apparatuses having an  
25 image input section for inputting a draft image and an image

output section for outputting the draft image, wherein the image formation method comprises the steps of:

(a) reading a draft image at the image input section of each of the image formation apparatuses;

5 (b) producing outputs of the draft images from its image output section of a predetermined one of the image formation apparatuses ,

(c) preparing calibration data containing calibration patterns being collected at the image input section of each  
10 of the image formation apparatuses to be output from the image output section of the predetermined image formation apparatus; and

(d) correcting the draft image input from the image input section of each of the plurality of the image formation  
15 apparatuses based on the calibration data prepared at the preparing step.

28. A computer program encoding an image formation method, which employs a plurality of image formation apparatuses  
20 connected together, each of the image formation apparatuses having an image input section for inputting a draft image and an image output section for outputting the draft image, wherein the image formation method comprises the steps: (a) reading a draft image at the image input section of each of the image  
25 formation apparatuses;

(b) producing outputs of the draft images from the image output section of a predetermined one of the image formation apparatus;

5 (c) preparing calibration data containing calibration patterns being collected at the image input section of each one of the image formation apparatuses to be output from the image output section of the predetermined image formation apparatus; and

10 (d) correcting the draft image input from the image input section of each of the plurality of image formation apparatuses based on the calibration data prepared at the step (c).

29. An image formation system comprising:

15 a plurality of image formation apparatuses connected together, each of the image formation apparatuses having an image input section for inputting a draft image and an image output section for outputting the draft image, at least a first one of the image formation apparatuses reading a draft image at the input  
20 section, and a second one of the image formation apparatuses producing an output of the draft image from the image output section, wherein

of the first one of the image formation apparatuses further comprises:

25 a first memory which stores first instrumental error

correction values corresponding to read characteristics of  
the image input section of the first image formation apparatus;  
and

an output unit which outputs the draft image read at  
5 the image input section of the first image formation apparatus  
and the first instrumental error correction values stored in  
the first memory, and

the second image formation apparatuses further  
comprises:

10 a second memory which stores second instrumental error  
correction values corresponding to read characteristics of  
the image input section of the second image formation apparatus;

an image processing parameter preparing unit which  
prepares image processing parameters corresponding to the read  
15 characteristics of the image input section of the first image  
formation apparatus by changing the image processing parameters  
of the second image formation apparatus based on the first  
instrumental error correction values output from the first  
image formation apparatuses and the second instrumental error  
20 correction values stored in the second memory; and

a correcting unit which corrects the draft image read  
at the image input section of the first image formation apparatus,  
based on the image processing parameters prepared by the image  
processing parameter preparing unit.

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30. The image formation system according to claim 29, wherein the image processing parameter preparing unit further comprises:

an intra-apparatus parameter preparing unit which  
5 prepares image processing parameters corresponding to the read characteristics of the image input section of the second image formation apparatus by comparing a target value containing calibration data obtained by reading at the image input section of the second image formation apparatus with calibration  
10 patterns printed out from the image output section of the second image formation apparatus; and

an inter-apparatus parameter preparing unit which prepares image processing parameters corresponding to the read characteristics of an image input section of the first image  
15 formation apparatuses by changing the image processing parameters corresponding to the read characteristics of the image input section of the second image formation prepared by the intra-apparatus parameter preparing unit based on the first instrumental error correction values output from the  
20 first image formation apparatus and the second instrumental error correction values corresponding to the read characteristics of the image input section of the second image formation apparatus.

25 31. The image formation system according to claim 30, wherein



the correcting unit

corrects the draft image read at the image input section  
of the first image formation apparatus based on the image  
processing parameters prepared by the inter-apparatus  
5 parameter preparing unit, and also

corrects the draft image read at the image input section  
of the second image formation apparatus based on the image  
processing parameters prepared by the intra-apparatus  
parameter preparing unit.

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32. The image formation system according to claim 29, further  
comprising:

a server for storing a draft image output from the first  
image formation apparatuses and the first instrumental error  
15 correction values corresponding to the read characteristics  
of the image input section of the first apparatus by relating  
the draft image to the first instrumental error correction  
values, and transmitting the stored draft image and the  
corresponding instrumental error correction values to the  
20 second image formation apparatus according to a transmission  
request from the second one or few image formation apparatuses.

33. The image formation system according to claim 29, wherein  
the image input section is a scanner, and the image output  
section is a color printer.

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34. The image formation system according to claim 29, wherein the plurality of the image formation apparatuses are connected via a network.

5 35. A first image formation apparatus connected with a second image formation apparatus to carry out data communications with each other comprising:

an image input section which reads a draft image and converts the draft image into image data;

10 an image output section which prints out the image data that is read at the image input section;

a memory which stores first instrumental error correction values corresponding to read characteristics of the image input section; and

15 a transmitting unit which transmits to the second image formation apparatus the draft image read at the image input section and the first instrumental error correction values corresponding to the read characteristics of the image input section stored in the memory.

20 36. The first image formation apparatus according to claim 35, wherein

the image input section is a scanner, and the image output section is a color printer.

25 37. The first image formation apparatus according to claim

35, wherein

the first image formation apparatus is connected with the second image formation apparatus via a network.

5 38. A first image formation apparatus connected with a second image formation apparatus to carry out data communications with each other the first image formation apparatus and the second image formation apparatus each comprising:

10 an image input section which reads a draft image and converts the draft image into image data;

an image output section which prints out the image data that is read at the image input section;

15 a memory which stores second instrumental error correction values corresponding to read characteristics of the image input section;

20 a receiving unit which receives a draft image that is read at the image input section of the second image formation apparatus and first instrumental error correction values corresponding to read characteristics of the image input section of the second image formation apparatus;

25 an image processing parameter preparing unit which prepares image processing parameters corresponding to the read characteristics of the image input section of the second image formation apparatus received by the receiving unit by changing

the image processing parameters of the first image formation apparatus based on the first instrumental error correction values received by the receiving unit and the second instrumental error correction values stored in the memory;

5 and

a correcting unit which corrects the draft image read at the image input section of the second image formation apparatus received by the receiving unit based on the image processing parameters prepared by the image processing parameter preparing unit.

39. The first image formation apparatus according to claim 38, wherein

the image processing parameter preparing unit further comprises:

an intraapparatus parameter preparing unit which prepares image processing parameters corresponding to the read characteristics of the image input section of the first apparatus by comparing a target value with calibration data obtained by reading at the image input section of the first apparatus calibration patterns printed out from the image output section of the first apparatus; and

an inter-apparatus parameter preparing unit which prepares image processing parameters corresponding to the read characteristics of an image input section of the second image

formation apparatus received by the receiving unit by changing the image processing parameters corresponding to the read characteristics of the image input section of the first apparatus prepared by the intra-apparatus parameter preparing unit based on the first instrumental error correction values received by the receiving unit and the second instrumental error correction values stored in the memory.

40. The image formation apparatus according to claim 39,  
10 wherein  
the correcting unit  
corrects the draft image read at the image input section of the second image formation apparatus based on the image processing parameters prepared by the inter-apparatus  
15 parameter preparing unit, and the correcting unit also  
corrects the draft image read at the image input section of the first apparatus based on the image processing parameters prepared by the intra-apparatus parameter preparing unit.

20 41. The first image formation apparatus according to claim 38, wherein  
the image input section is a scanner, and the image output section is a color printer.

42. The first image formation apparatus according to claim  
25 38, wherein

the first image formation apparatus is connected with the second image formation apparatus via a network.

43. An image formation method comprising the steps of:

5 (a) reading an image of a draft at an image input section of a first image formation apparatus; and

(b) transmitting the draft image read at the image input section of the first image formation apparatus and first instrumental error correction values corresponding to read characteristics of the image input section of the first image formation apparatus from in a memory to an image output section of a second image formation apparatus connected to the first image formation apparatus.

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15 44. The image formation method according to claim 43, wherein the image input section is a scanner, and the image output section is a color printer.

45. The image formation method according to claim 43, wherein  
20 the first image formation apparatus is connected with the second image formation apparatus via a network.

46. An image formation method comprising:

(a) receiving a draft image at an image input section  
25 of a second image formation apparatus and first instrumental

error correction values corresponding to read characteristics of the image input section of the second image formation apparatus;

(b) preparing image processing parameters corresponding to the read characteristics of the image input section of the second image formation apparatus by changing the image processing parameters of a first image formation apparatus connected to the second image formation apparatus based on the first instrumental error correction values and second instrumental error correction values corresponding to the read characteristics of an image input section of the first apparatus stored in a memory;

(c) correcting the draft image read at the image input section of the second image formation apparatus based on the image processing parameters prepared in the step (b); and

(d) printing out the draft image corrected in the step (c) at an image output section of the first image formation apparatus.

47. The image formation method according to claim 46, wherein the

step (b) further comprises:

(e) preparing image processing parameters corresponding to the read characteristics of the image input section of the first image formation apparatus by comparing

a target value with calibration data obtained by reading at the image input section of the first image formation apparatus with calibration patterns printed out from the image output section of the first image formation apparatus; and

5 (f)preparing image processing parameters corresponding to the read characteristics of the image input section of the second image formation apparatus, by changing the image processing parameters corresponding to the read characteristics of the image input section of the first image  
10 formation apparatus prepared, based on the first instrumental error correction values received and the second instrumental error correction values corresponding to the read characteristics of the image input section of the first image formation apparatus stored in the memory.

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48. The image formation method according to claim 47, wherein in the step (c),

the draft image read at the image input section of the second image formation apparatus is corrected based on the  
20 image processing parameters prepared at the step (f), and

the draft image read at the image input section of the first the formation apparatus is corrected based on the image processing parameters prepared at the step (e).

25 49. The image formation method according to claim 46, wherein



the image input section is a scanner, and the image output section is a color printer.

50. The image formation method according to claim 46, wherein  
5 the first image formation apparatus is connected with the second image formation apparatus via a network.

51. A computer program encoding the steps of

(a) reading a draft image at an image input section of  
10 a first image formation apparatus; and

(b) transmitting the draft image read at the image input section and first instrumental error correction values corresponding to read characteristics of the image input section stored in a memory to a second image formation apparatus  
15 connected to the first image formation apparatus.

52. A computer program encoding the steps of:

(a) receiving a draft image read at an image input section of a second image formation apparatus and first instrumental  
20 error correction values corresponding to read characteristics of the image input section of the second image formation apparatus;

(b) preparing image processing parameters corresponding to the read characteristics of the image input  
25 section of the second image formation apparatus by changing

the image processing parameters of a first image formation  
apparatus based on the first instrumental error correction  
values received and second instrumental error correction values  
corresponding to read characteristics of an image input  
5 section of the first image formation apparatus stored in a  
memory;

(c) correcting the received draft image read at the image  
input section of the second image formation apparatus based  
on the image processing parameters prepared at step (b); and

10 (d) printing out the draft image corrected at step (c)  
at an image output section of the first image formation  
apparatus.